REMARKS

Very thanks for Examination's suggestion and thanks for finding some citations about the present invention, thereby, the applicant may know more information about the invention. This case has been carefully reviewed and analyzed in view of the office action. All details of the reference prior arts are fully considered and compared with the present invention.

Responsive to the objections and rejections made of the Examiner in office action. We have amended the specification, claims and abstracts. All the errors disclosed in that office action has been corrected according to the Examiner's indications disclosed in the official action.

ABOUT CLAIM REJECTION OF 35USC102

Indeed the citations disclose some features of the present invention, and the applicant agrees with these viewpoints, however applicant discovers that some main features of the present invention are not disclosed in the citation which can form the novelty and inventive step of the present invention.

To illustrate the novelty of the present invention and overcome the objection from the citations, the applicant decides to cancel Claims 1 to 5, without prejudice or disclaimer of the subject matter thereof, and add new claims 6 and 7. The added new claim 6 is based on the original claim 1, 2 and 4 and the features in Fig. 3 and 5 and 6 of the present invention. The added new claim 7 is based on the original claim 1, 3 and 4 and the features in Fig. 3-1 and 5 and 6-1 of the present invention. The relation of the new claims with respect to the original claims are shown in the following.

CLAIMS WITH NUMERALS SHOWS THE CHANGE OF NEW CLAIMS WITH RESPECT THE ORIGINAL CLAIMS

Claims 1 to 5 (Cancelled)

Claim 6. (New) ~~1.~~ A heat dissipating device comprises

a turbine-type fan 2 having a plurality of blades 21 which are

axially arranged along an axis of the fan; a cover 22 covering the blades 21; a wind collecting mask 25 installed below the cover 22; and a wind outlet 24 formed in the wind collecting mask;

a heat dissipating seat 3 installed below the turbine-type fan 2; wherein a bottom surface of the heat dissipating seat is parallel to the axis of the fan; and

a plurality of heat dissipating units 34 extending from a surface of the heat dissipating seat 3 between the seat and the turbine-type fan 2;

wherein wind is sucked by the turbine-type fan 2, then flows toward the wind collecting mask 25, then flows out of the outlet of the wind collecting mask 25 to enter into the heat dissipating units 34 and then flows to the heat dissipating seat 3 for dissipating heat from the heat dissipating units 34 and the heat dissipating seat 3.

~~Claim 2. The heat dissipating device as claimed in claim 1,~~ wherein the surface of the heat dissipating seat 3 is a concave surface.

~~Claim 3. The heat dissipating device as claimed in claim 1, wherein the surface of the heat dissipating seat 3 is a convex surface.~~

~~Claim 4. The heat dissipating device as claimed in claim 1,~~ wherein the heat dissipating units 34 are pin fins ~~post~~ and an upper surface formed by upper ends of the heat dissipating units 34 is formed as a concave surface and a bottom surface of lower ends of the heat dissipating units 34 is formed as a convex surface corresponding to the concave surface of the heat dissipating seat 3; a bottom surface of the wind collect mask 25 is a convex surface corresponding to the concave surface formed by an upper end of the heat dissipating units 34.

~~Claim 5. The heat dissipating device as claimed in claim 1, wherein the heat dissipating units 34 are heat dissipating fins.~~

Claim 7. (New) ~~1.~~ A heat dissipating device comprises

a turbine-type fan 2 having a plurality of blades 21 which are axially arranged along an axis of the fan; a cover 22 covering the blades 21; a wind collecting mask 25 installed below the cover 22; and a wind outlet 24 formed in the wind collecting mask;

a heat dissipating seat 3 installed below the turbine-type fan 2; wherein a bottom surface of the heat dissipating seat is parallel to the axis of the fan; and

a plurality of heat dissipating units 34 extending from a surface of the heat dissipating seat 3 between the seat and the turbine-type fan 2;

wherein wind is sucked by the turbine-type fan 2, then flows toward the wind collecting mask 25, then flows out of the outlet of the wind collecting mask 25 to enter into the heat dissipating units 34 and then flows to the heat dissipating seat 3 for dissipating heat from the heat dissipating units 34 and the heat dissipating seat 3.

~~Claim 3. The heat dissipating device as claimed in claim 1,~~ wherein the surface of the heat dissipating seat 3 is a convex surface.

~~Claim 4. The heat dissipating device as claimed in claim 1,~~ wherein the heat dissipating units 34 are pin fins ~~post~~ an upper surface formed by upper ends of the heat dissipating units 34 is formed as a concave surface and a bottom surface of lower ends of the heat dissipating units is formed as a concave surface corresponding to the convex surface of the heat dissipating seat 3; a bottom surface of the wind collect mask 25 is a convex surface corresponding to the concave surface formed by the upper ends of the heat dissipating units 34.

DISCUSSION ABOUT THE NOVELTY THE PRESENT INVENTION

(A) For the New claim 6

Referring to Fig. 6 and Fig. 7 of the present invention.

The new claim 6 claims the heat dissipating device having the configuration illustrated in Fig. 6 of the present invention. The function of the claim 6 is illustrated in Fig. 7.

(1) The first feature of claim 6 is that "a turbine-type fan 2 having a plurality of blades 21 which are axially arranged along an axis of the fan;" and " the seat dissipating seat 3 installed below the turbine-type fan 2, wherein a bottom surface

of the heat dissipating seat is parallel to the axis of the fan;"

This feature can be illustrated in Fig. 4 of the present invention. However there are three citations USP2003/0137,807, USP5,455,382 and USP4,823,869. However these citations do not disclose above features. This feature in claim 6 of the present invention will make the wind generating by the fan is effectively blown into the fins 34.

(2) The second feature of claim 6 of the present invention is that "wherein the heat dissipating units 34 are pin fins and an upper surface formed by upper ends of the heat dissipating units 34 is formed as a concave surface and a bottom surface of lower ends of the heat dissipating units 34 is formed as a convex surface corresponding to the concave surface of the heat dissipating seat 3, a bottom surface of the wind collect mask 25 is a convex surface corresponding to the concave surface formed by an upper end of the heat dissipating units 34"

The feature is illustrated in Fig. 3, 5 and 6. The three citations USP2003/0137,807, USP5,455,382 and USP4,823,869 have no similar structure.

In fact as illustrated in the official action, the citations have features of the surface of the heat dissipating seat (as element 3 in the present invention) is a concave surface, such as those disclosed by '869 (as that pointed out by the office action), but no citation has the feature that "wherein the heat dissipating units 34 are pin fins post and an upper surface formed by upper ends of the heat dissipating units 34 is formed as a concave surface and a bottom surface of lower ends of the heat dissipating units 34 is formed as a convex surface corresponding to the concave surface of the heat dissipating seat 3, a bottom surface of the wind collect mask 25 is a convex surface corresponding to the concave surface formed by an upper end of the heat dissipating units 34"

The effect of this configuration is that: referring to Fig. 7, it is illustrated that most of wind will blow downwards to blow the center area of the seat 3. Since the surface 321 of the seat is a concave surface, the wind direction H3 is guided to have uniform distribution for dissipating heat effectively. Thereby by the double effects of the concave surface 321 and the wind collecting mask 25, the wind direction H3 is guided so that no dead point is formed. By the wind

collecting effect of the wind collecting mask, the wind is strong so that the resistance at the tops of the posts is reduced greatly. Meanwhile, wind resistance is reduced greatly as the wind is in contact with the concave surface of the seat and the turbulent is reduced greatly. Thereby, heat dissipating effect is improved greatly."

(B) Thus from above discussion in (1) and (2), it is illustrated that no citation has the structure disclosed in the new claim 6 of the present invention, even combination of the three citations cannot form the main features in above (1) and (2), thus from functional and structure views, it is apparent that the new claim 6 of the present invention is novel and inventive over the citations USP2003/0137,807, USP5,455,382 and USP4,823,869.

(B) For the New claim 7

Referring to Fig. 6-1 and Fig. 7-1 of the present invention. The new claim 7 claims the heat dissipating device having the configuration illustrated in Fig. 6-1 of the present invention. The function of the claim 6 is illustrated in Fig. 7.

(1) The first feature of claim 7 is that "a turbine-type fan 2 having a plurality of blades 21 which are axially arranged along an axis of the fan," and " the seat dissipating seat 3 installed below the turbine-type fan 2, wherein a bottom surface of the heat dissipating seat is parallel to the axis of the fan,"

This feature can be illustrated in Fig. 4 of the present invention. However there are three citations USP2003/0137,807, USP5,455,382 and USP4,823,869. these citations do not disclose above features. This feature in claim 6 of the present invention will make the wind generating by the fan is effectively blown into the fins 34.

(2) The second feature of claim 6 of the present invention is that "the heat dissipating units 34 are pin fins, post an upper surface formed by upper ends of the heat dissipating units 34 is formed as a concave surface and a bottom surface of lower ends of the heat dissipating units is formed as a concave surface corresponding to the convex surface of the heat dissipating seat 3, a bottom surface of the wind collect mask 25 is a convex surface corresponding to the concave surface formed by the upper ends of the heat dissipating units 34;"

The feature is illustrated in Fig. 3-1, 5 and 6-1. The three citations USP2003/0137,807, USP5,455,382 and USP4,823,869 have no similar structure.

In fact as illustrated in the official action, the citations have features of the surface of the heat dissipating seat (as element 3 in the present invention) is a concave surface, such as those disclosed by '869 (as that pointed out by the office action), but no citation has the feature that "the heat dissipating units 34 are pin fins and an upper surface formed by upper ends of the heat dissipating units 34 is formed as a concave surface and a bottom surface of lower ends of the heat dissipating units is formed as a concave surface corresponding to the convex surface of the heat dissipating seat 3; a bottom surface of the wind collect mask 25 is a convex surface corresponding to the concave surface formed by the upper ends of the heat dissipating units 34."

The effect of this configuration is that: referring to Fig. 7-1, it is illustrated that "most of wind will blow downwards to blow the center area of the seat 3. Since the surface 321 of the seat is a convex surface, the wind direction is guided to have uniform distribution for dissipating heat effectively. Thereby, by the double effects of the concave surface and the wind collecting mask, the wind direction is guided so that no dead point is formed."

(3) Thus from above discussion in (1) and (2), it is illustrated that no citation has the structure disclosed in the new claim 7 of the present invention, even combination of the three citations cannot form the main features in above (1) and (2), thus from functional and structure views, it is apparent that the new claim 6 of the present invention is novel and inventive over the citations USP2003/0137,807, USP5,455,382 and USP4,823,869.

(C) It should be noted that the difference of the structure illustrated in claim 6 and the structure in claim 7 of the present invention is that the structure in claim 6 is suitable for dissipating heat from a greater device located below the heat dissipating device. The structure in claim 7 is suitable for dissipating heat from a smaller device located below the heat dissipating device. This is because in the structure of claim 7 OF the present invention, some wind will blow downwards (see Fig. 7-1 of the present invention) and thereby it is not suitable for great

device which has an area greater than the seat of the heat dissipating device.

(D) RESULT

Since in above discussion, it is apparent that no prior art has the features of the present invention, especially in new claims 6 and 7. Furthermore, as we know that no other prior art has features of the present invention. Thus, the present invention is novel and inventive.

If there is any error in the specification, or claims, applicant requests and authorizes Examiner to amend the claims, specification and drawings of the present invention so that they can match the requirement of U. S. Patent. Attentions of Examiner to this matter are greatly appreciated.

It is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectively requested.

Respectfully submitted.

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"MARK-UP" COPY OF THE AMENDED SPECIFICATION

HEAT DISSIPATING DEVICE

Field of the invention

The present invention relates to heat dissipating devices, and particular to a heat dissipating device having a structure which can guide wind effectively so that no dead point is generated.

Background of the invention

Due to the compactness, high speed, and moduleless, and small sizes of modern electronic devices, heat dissipation of the electronic devices must be promoted with the improvement of the technologies.

Currently, wind blowing from heat dissipating fans has a wide coverage and is weak. Moreover, dead ends are formed. With reference to Fig. 2, a direct blowing fan D blows wind by using blades A. Thereby, the wind in the center of the fan is weak or no wind blows out in the center of the fan so as to form a dead point E.

For the seat B of the heat dissipating device, it is often that the center of the heat dissipating seat has highest thermal energy so that the heat dissipation is not preferred. Theoretically, the larger the heat dissipating area, the higher the heat dissipating efficiency. Thereby, more and more heat dissipating fins or pin fins ~~posts~~ cause stronger heat dissipating effect. However, in prior art heat dissipating seat, since tops C of the fins or pin fins ~~posts~~ have interface impedance which increase with the increment of the density of the fins or pin fins ~~posts~~. Thereby, the density of the fins or pin fins ~~posts~~ are confined, otherwise the wind will reflect from the tops of the fins or pin fins ~~posts~~ so that the wind can not flow into the heat dissipating device, as a result the heat dissipating efficiency is decreased greatly.

In another prior art, turbine form heat dissipating fan, as fan D1 illustrated in Fig. 2-1, is used. Since the intensity of wind is strong and the wind direction H1 cannot be controlled. Thereby, the wind flow H1 is unsteady. Turbulent

flow or high density flow is easily generated so as to form another kind of heat dissipating dead point E2. Thereby, the improvement of heat dissipating efficiency is limited.

Another improvement is water-cooled heat dissipating devices, however, such kind devices easily generate wet moistures. This is unbeneficial to electronic products.

Summary of the Invention

Accordingly, the primary object of the present invention is to provide a heat dissipating device having a structure which can guide wind effectively so that no dead point is generated.

To achieve above said object, the present invention provides a heat dissipating device comprises a turbine-type fan having a plurality of blades; a cover covering the blades; a wind collecting mask installed below the cover; and a wind outlet formed in the wind collecting mask. A heat dissipating seat is installed below the turbine-type fan; and a plurality of heat dissipating units extends from a surface of the heat dissipating seat. Wind is sucked by the turbine-type fan, then flows toward the wind collecting mask, then flows out of the outlet of the wind collecting mask to enter into the heat dissipating units and then flows to the heat dissipating seat for dissipating heat from the heat dissipating units and the heat dissipating seat.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

Brief Description of the Drawings

Fig. 1 is a perspective view of a prior art heat dissipating device.

Fig. 2 shows the wind flow of the prior art heat dissipating device.

Fig. 2-1 is a schematic view showing the airflow in the prior art turbine type heat dissipating device.

Fig. 3 is an exploded perspective view of the present invention.

Fig. 3-1 shows another embodiment of the present invention.

Fig. 4 is a perspective view of the present invention.

Fig. 5 is a structural perspective view of the fan of the present invention.

Fig. 5-1 is a lateral view showing the structure of the fan of the present invention.

Fig. 6 shows one embodiment of the present invention, wherein an upper surface of the heat dissipating seat is concave.

Fig. 6-1 shows one embodiment of the present invention, wherein an upper surface of the heat dissipating seat is convex.

Fig. 7 shows the wind direction of the embodiment illustrated in Fig. 6.

Fig. 7-1 shows the wind direction of the embodiment illustrated in Fig. 6-1.

Detailed Description of the Invention

In order that those skilled in the art can further understand the present invention, a description will be described in the following in details. However, these descriptions and the appended drawings are only used to cause those skilled in the art to understand the objects, features, and characteristics of the present invention, but not to be used to confine the scope and spirit of the present invention defined in the appended claims.

With reference to Figs. 3, 4, 5 and 5-1, the present invention comprises a turbine-type fan 2, the turbine-type fan 2 has a plurality of blades 21; a cover 22 covering the blades 21; a wind collecting mask 25 installed below the cover 22; and a wind outlet 24 at a center of the wind collecting mask 25. A heat dissipating seat 3 is installed below the turbine-type fan 2. A plurality of heat dissipating pin fins ~~posts~~ 34 extend from a surface of the heat dissipating seat 3 (in the present invention, the heat dissipating pin fins ~~posts~~ 34 are only one example, other devices which can achieve the same effect are also within the scope of the present invention, such as heat dissipating fins). The upper surface of the heat dissipating seat 3 is curved surface, for example, a concave surface 321 shown in Fig. 3, or a convex surface 322 shown in Fig. 4. The turbine-type fan 2 is locked to the heat dissipating seat 3 by screwing through the screw holes 23 thereof to

the screw rods 31 of the heat dissipating seat 3.

In operation of the present invention, referring to Figs. 6 and 6-1, where the tops of the pin fins ~~posts~~ are formed as a concave surface and the upper surface 321 of the heat dissipating seat 3 is concave. In this embodiment, wind H3 is sucked into the present invention by the fan. The air will be collected by the wind collecting mask 25 so as to enhance the strength of the wind. The wind blows downward from the wind outlet 24. The wind resistance will be reduced by concave surface formed by the tops of the pin fins ~~posts~~ C3. The wind will distribute along the cambered surface of the top of the pin fins ~~posts~~ and the surface of the mask so as to dissipate heat to be blown out with an uniform distribution.

Furthermore, most of wind will blow downwards to blow the center area of the seat 3. Since the surface 321 of the seat is a concave surface, the wind direction H3 is guided to have uniform distribution for dissipating heat effectively. Thereby, by the double effects of the concave surface 321 and the wind collecting mask 25, the wind direction H3 is guided so that no dead point is formed. By the wind collecting effect of the wind collecting mask, the wind is strong so that the resistance at the tops of the pin fins ~~posts~~ is reduced greatly. Meanwhile, wind resistance is reduced greatly as the wind is in contact with the concave surface of the seat and the turbulent is reduced greatly. Thereby, heat dissipating effect is improved greatly.

With reference to Figs. 6 and 6-1, in this embodiment, the tops of the pin fins ~~posts~~ are formed as a concave surface and the upper surface of the heat dissipating seat 3 is a convex surface. This design cause that the wind blow out with a larger area. This is also within the scope of the present invention.

The advantages of the present invention is that strong wind is generated so that the heat dissipating is improved. The pressure at the tops of the heat dissipating device is reduced so that wind can blow into the heat dissipating seat effectively. The density of the fins or post can be increased greatly so as to increase the heat dissipating area greatly. The wind collecting mask has the effect of guiding airflow, thereby, no heat dissipating dead point being formed.

The present invention is thus described, it will be obvious that the same may

be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the present invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

ABSTRACT

A heat dissipating device comprises a turbine-type fan having a plurality of blades; a cover covering the blades; a wind collecting mask installed below the cover; and a wind outlet formed in the wind collecting mask. A heat dissipating seat is installed below the turbine-type fan; and a plurality of heat dissipating units extends from a surface of the heat dissipating seat. Wind is sucked by the turbine-type fan, then flows toward the wind collecting mask, then flows out of the outlet of the wind collecting mask to enter into the heat dissipating units and then flows to the heat dissipating seat for dissipating heat from the heat dissipating units and the heat dissipating seat.